

DIVISION OF GROUND WATER PROTECTION
POSITION PAPER SUPPORTING 2008 PROPOSED RULE CHANGE
(1200-1-6)
for
ADVANCED TREATMENT SYSTEMS
DRIP DISPOSAL
and
MAINTENANCE PROVIDER CERTIFICATION

SEPTEMBER 2008

Program Overview

Tennessee Code/Title 68 Health, Safety and Environmental Protection/Chapter 221 Water and Sewerage/Part 4 Subsurface Sewage Disposal Systems reflects the body of law established to accomplish the appropriate disposal of sewage in areas that are not served by a public sewer. This body of law⁽¹⁾ specifically mandates that “In order to minimize the possibility of endangering the health and welfare of the public and/or the development of esthetically offensive conditions, subsurface sewage disposal systems shall be so located, constructed and maintained that wastes discharged to or from such systems:

- (1) Do not contaminate any drinking water supply;
- (2) Are not accessible to rodents, insects or other potential carriers of disease;
- (3) Do not pollute or contaminate surface or ground water;
- (4) Are not a health hazard by being accessible to the general public;
- (5) Do not cause a nuisance due to odor or unsightly appearance; and
- (6) Will not violate any other laws or regulations governing water pollution or sewage disposal.”

The duties⁽²⁾ of the commissioner, applicable to this position paper, with respect to subsurface sewage disposal requirements are:

- (1) Exercise general supervision over the planning, location, construction, operation and maintenance of subsurface sewage disposal systems;
- (2) Adopt and promulgate rules and regulations as the commissioner deems necessary to accomplish the purposes of this part, including the adoption of a system of fees for services and permits.
- (3) Enforce the provisions of this part and rules and regulations promulgated pursuant to provisions of this part and make such inspections and investigations as are necessary to determine compliance with the same.
- (4) Issue permits for the installation of subsurface sewage disposal systems.

- (5) Issue permits to persons engaging in the business of the construction, alteration, extension or repair of subsurface sewage disposal systems and to persons engaging in the business of removing accumulated waste from such systems.

A critical duty of the commissioner mandated by statute ⁽³⁾ is as follows: “Recognizing the acute need for environmentally safe and economically feasible on-site wastewater disposal systems for sites with marginal soil resources, and further recognizing the potential for development of numerous satisfactory designs, the department is hereby charged to continually strive to identify and/or develop design and operating criteria for systems that have potential for functioning properly on sites with limited soil depth above a limiting horizon (e.g., fragipan, perched water table, rock).”

To accomplish the mandates of the above-referenced statutes, **Rules of Department of Environment and Conservation, Division of Ground Water Protection, Chapter 1200-1-6/Regulations to Govern Subsurface Sewage Disposal Systems**⁽⁴⁾ have been promulgated. These Rules prescribe the standards to be met in the course of: property subdivision, conventional and alternative subsurface sewage disposal system (SSDS) permit issuance, conventional and alternative SSDS construction, percolation tests, septic tank construction, establishing buffers (setbacks), design of dosing systems, and maintenance of SSDS. The Rules also outline the requirements for performing services associated with soils mapping, SSDS installation, septic tank pumping, and septic disposal site approval and use.

The rule promulgation process includes publication of the proposed rule change through the Secretary of State’s office, public hearings, consideration of all comments submitted, review by the Tennessee Department of Environment and Conservation (TDEC) Office of General Counsel, subsequent review and signature by the Commissioner of TDEC followed by review by the Attorney General’s office. Upon completion of the above-listed review process the final version of the proposed rule change is submitted to the Secretary of State’s office where it remains for 75 days before becoming effective unless the Legislative Government Operations Committee elects to suspend the proposed rule.

TDEC’s Division of Ground Water Protection (GWP) has historically been the regulatory authority responsible for regulating/managing the disposal of domestic sewage in areas not served by a public sewerage system. TDEC’s Division of Water Pollution Control has historically been the regulatory authority responsible for regulating/managing public sewerage systems.

GWP has largely employed systems involving septic tanks and soil absorption fields. As described in U.S. Environmental Protection Agency’s **Onsite Wastewater Treatment Systems Manual**⁽⁵⁾:

“...such systems are referred to as *conventional systems*. Septic tanks remove most settleable and floatable material and function as an anaerobic bioreactor that promotes partial digestion of retained organic matter. Septic tank effluent, which contains significant concentrations of pathogens and nutrients, has traditionally been discharged to soil, sand, or other media absorption fields for further treatment through biological processes, adsorption, filtration, and infiltration into underlying soils. Conventional systems work well if they are installed in areas with appropriate soils and hydraulic capacities; designed to treat the incoming waste load to meet public health, ground water, and surface water performance standards; installed properly; and maintained to ensure long-term performance.”

Historically, by far the most common SSDS design within the State of Tennessee (State) consists of a two-compartment septic tank followed by an aggregate-filled (stone) disposal field line distribution system designed to allow the septic tank effluent to move into the surrounding soil. These types of systems are especially suited for deep (>three feet), moderately porous soil conditions. If solids are removed from the septic tank at appropriate intervals these systems have an estimated life span of 10 to 30 years. Conventional substitute products (chamber, expanded polystyrene, and large diameter gravelless pipe) have also been used productively in place of stone aggregate systems.

The State has tremendously variable soil from well drained, deep, porous soils to shallow, clayey, poorly drained soils – and most every soil in between. Type and amount of soil are the two largest factors with respect to whether a system can be permitted for a piece of property.

In areas of the State with certain limiting soil conditions “alternative system types” have been utilized effectively. Low pressure pipe (LPP) distribution systems are often utilized when an area of “good” soil exists but is not large enough to accommodate a conventional system. LPP systems utilize uniform distribution of effluent over the entire soil area and are positioned in a shallower portion of the soil profile. In most cases the suitability of soil for sewage effluent treatment and disposal decreases with depth of soil – largely due to increasing clay content. Elevated mound systems are utilized when an area of suitable soil is underlain by a shallow restrictive horizon. Mounds are a constructed system consisting of a gravel distribution bed underlain by sand. These systems are constructed on top of the soil area and serve to accomplish the treatment that an otherwise “deep” soil would provide. The underlying soil is still the destination of the effluent. Waste stabilization lagoons are a third alternative system that largely finds application in deep, impermeable soils. Waste stabilization lagoons are designed with evaporation as the primary component of reintroducing the water back in to the environment.

Drip Disposal

In keeping with the above-mentioned statute charging TDEC to strive to identify and/or develop design and operating criteria for systems that have potential for functioning properly on sites with limited soil depth, GWP is proposing to incorporate drip disposal as an additional alternative means of distributing wastewater into the soil environment. Drip disposal is accomplished through flexible tubing approximately ½ inch in diameter. The proposal will require drip emitter openings to be placed every 2 feet and be pressure compensating. Fundamentally, drip disposal is most comparable to the current LPP option; although, there are some distinct differences. LPP lines are typically 5 feet to 6 feet apart and utilize stone aggregate along the length of each line segment. Drip disposal lines are typically positioned 2 feet apart and are “plowed” into position with no aggregate surrounding the line. Exit points of a LPP line are open holes typically 60 inches apart and approximately 5/32 inch in diameter. Exit points for drip disposal line are 24 inches apart and each orifice has a pressure compensating fitting which allows a uniform discharge rate within the operating pressure range. Also, the rate of flow from each emitter is a steady drip as opposed to a continuous stream provided by the orifices in a LPP system.

Installation of disposal lines without aggregate can be advantageous over lines installed with aggregate. The presence of aggregate within a properly constructed disposal line results in the movement of effluent along the line irrelevant of the transmission line. While this movement is largely advantageous, if the integrity of the line is compromised anywhere along its length the effluent will migrate to that point and potentially leave the line. For example, if a 100 foot conventional gravel distribution line is installed on grade, as the effluent enters the line it will flow (given adequate volume) throughout the length of the line. This movement is advantageous as long as the entire line has the integrity associated with undisturbed soil. However, considering the example, if a utility line (water, electric, phone...) is constructed through the gravel-filled ditch, the integrity of the line would be compromised and, as a result, the effluent within the ditch would escape through the breach potentially rendering the entire 100 foot line useless and create a failure along the utility line. Drip disposal line is installed without aggregate. Therefore, if the integrity of the soil profile is disturbed along the length of the drip line, movement of effluent along the line and escape through the breach would not be as likely as with an aggregate system. Drip disposal line breaks can be spliced together with new drip disposal line.

Historically, an area of soil in which conventional type disposal line has been installed is limited with respect to being able to accommodate additional disposal line. For example, if an individual's backyard is occupied by field line installed 30 or 40 years ago and due to biomat or

other factors the disposal lines are not functioning, it is not practical to go into the same area and install new lines. It would be highly likely that in the course of installing the new lines some of the aggregate associated with the older lines would be encountered, and anywhere the new lines cross or encounter the old lines the integrity of the new lines would be lost and effluent discharged into the new lines would “short circuit” into the old lines. If drip disposal lines (no aggregate) are utilized on the front end, it is more practical to utilize the same area again with drip disposal lines in the event the initial set of lines lose their capability to transmit effluent. While there may be some tendency for effluent to move along the drip line and associated plow furrow, this tendency is greatly reduced relative to an aggregate filled ditch, and as a result an area is more practically “reused” with drip disposal lines than with conventional gravel-filled disposal lines.

The attributes of drip disposal allow for some soils to be utilized that GWP cannot currently permit. Drip line installation will be at a depth of approximately 8 inches from the ground surface. Twelve inches of buffer will be maintained between the depth of the drip line and the top of the shallowest restrictive horizon. Therefore total soil depth for a drip disposal system will be a minimum of 20 inches. The only other permitting option for soils with this shallow depth is a “modified” mound system. The modified mound option has been infrequently used due to slope constraints, aesthetic issues and expense of construction.

Drip disposal systems will be sized based on the estimated loading rate(s) of the soil and the volume of waste being generated. For example, a system supporting a 3-bedroom home would be designed for 450 gallons of water per day (150 gallon per bedroom per day). A typical loading rate associated with soils in Tennessee is 0.2 gallons per square foot per day. Therefore a 450 gallon per day anticipated flow would require 2,250 square feet of application area (450 gallons per day divided by 0.2 gallons per day per square foot). This square footage divided by 2 (distance between the lines) results in 1,125 linear feet of drip line necessary to support the anticipated daily flow. With emitters spaced at 2 foot intervals and drip lines placed 2 feet apart the effective application area for each emitter is 4 square feet. Therefore each emitter would discharge 0.8 gallons of water per day – if the system was being used at capacity. Typical emitter flow capacity is 0.62 gallons per hour. Relative to any other technology GWP currently has available for consideration, drip disposal technology is clearly the most capable of distributing a volume of water over a given area over a given period time.

Advanced Treatment Systems

Along with the advantages of using drip disposal, GWP must consider how the quality of effluent being discharged through the drip lines affects the performance and longevity of the drip lines. While there is some support for discharging septic tank effluent directly into drip disposal lines, the clear industry standard is to place a treatment device between the septic tank and drip disposal field. The intent of this standard practice is to improve the quality of the effluent prior to discharge through drip lines. The performance and longevity of the drip disposal lines improve as the quality of effluent being discharged through them improves.

Advanced treatment systems (ATS) are secondary treatment devices designed to improve the quality of septic tank effluent for residential wastewater flows. GWP defines ATS, in part, as those systems that have been tested and shown to meet the provisions of the National Sanitation Foundation (NSF) Standard 40.

Devices that have achieved NSF Standard 40 approval can be summarized by the following excerpt from the NSF website:

“Standard 40 is for residential wastewater treatment systems having rated capacities between 400 gallons (1514 Liters) and 1500 gallons (5678 Liters) per day. The standard is not restrictive in the type of treatment technology. Any system can be evaluated.

The standard includes a wide range of product evaluation methods and criteria for residential treatment systems. Most notably is the ability of the treatment system to produce an acceptable quality of effluent. This is demonstrated during a six month (26 week) test where wastewater of required strength is subjected to the system at the rated capacity of the system as evenly dosed at periods prescribed by the standard. Stress sequences are included to simulate wash day, working parent, power outage, and vacation conditions. The effluent criteria required of a Class I system is based on the U.S. EPA secondary effluent treatment requirements for municipal treatment facilities. Testing can be performed at several test facilities.

In addition to the effluent performance, requirements also exist for product literature, including installation, operation and maintenance, and trouble shooting and repair manuals. The system must also meet minimum requirements for structural integrity, leakage, noise, electrical certification, access ports, failure sensing and signaling equipment (visual and audible alarms), flow design, data plate and service labels.”

U.S. EPA secondary effluent treatment requirements for municipal treatment facilities are (in part):

Carbonaceous Biochemical Oxygen Demand (CBOD)

- Cannot exceed 25 mg/l over a 30-day average.
- Cannot exceed 40 mg/l over a 7-day average.

Suspended Solids

- Cannot exceed 30 mg/l over a 30-day average.
- Cannot exceed 45 mg/l over a 7-day average.

Acidity (pH)

The pH of individual effluent samples shall be between 6.0 and 9.0.

Other requirements necessary to achieve NSF Standard 40 approval are as follows:

- The overall odor rating of each of the three diluted composite effluent samples shall be nonoffensive.
- Oily films and foaming shall not be visually detected in any of the diluted composite effluent samples.

Manufacturers of systems certified by NSF to the NSF Standard 40 criteria are required to provide the following warranty and service-related programs:

- The manufacturer should warrant all components of their residential wastewater treatment system covered by NSF Standard 40 to be free from defects in material and workmanship for a minimum of two years from the date of installation. The manufacturer may fulfill the terms of the warranty by repairing or exchanging any components that, in the manufacturer's judgement, show evidence of defect. A description of initial and extended service policies should be included in the owner's manual.
- A 2-year initial service policy should be furnished to the owner by the manufacturer or the authorized representative; the cost of the initial service policy should be included in the original purchase price. The initial policy should contain provisions for 4 inspection/service visits (scheduled once every six months over the 2-year period) during which electrical, mechanical, and other applicable components are inspected, adjusted and serviced.

- The initial service policy should contain provisions for an effluent quality inspection consisting of a visual assessment for color, turbidity, and scum overflow, and an olfactory assessment for odor.
- The initial service policy should contain a clause that states that the owner will be notified, in writing, about improper system operations that cannot be remedied at the time of inspection and that the written notification shall include an estimated date of correction.
- The manufacturer or authorized representative should make available, for purchase by the owner, an extended service policy with terms comparable to those in the initial service policy.
- In the event that a mechanical or electrical component must undergo off-site repairs, the local authorized representative should maintain a stock of mechanical and electrical components that may be temporarily installed until repairs are completed.
- Emergency service should be available within 48 hours of a service request.

Currently there are approximately 380 devices that have been certified by NSF for NSF Standard 40 Class I approval. These devices are represented by 34 companies (Appendix A).

Proposed ATS and Drip Disposal Model

The 2008 GWP rule change proposal allows for the implementation of drip disposal as an alternative means of dispersing effluent to the soil environment. Utilizing drip disposal, through this proposal, would only be permitted in conjunction with secondary treated effluent. Effluent treatment will be accomplished primarily by ATS, further defined as those systems with NSF Standard 40 approval. This “paired” technology will be available for consideration in support of subdivision evaluation and SSDS construction permit issuance. However, when this technology is used in support of construction permit issuance, the permit will not be only for construction but also for long term operation and maintenance of the system. As stated in TCA §68-221-401 (“...subsurface sewage disposal systems shall be so located, constructed and maintained...”) and TCA §68-221-403(a)(1) (“Exercise general supervision over the planning, location, construction, operation and maintenance of subsurface sewage disposal systems...”), GWP, through the Commissioner, has authority to include “operation and maintenance” as a component of our authority pertaining to subsurface sewage disposal systems.

GWP anticipates that ATS/drip disposal (ATSDD) permits will represent only a small percentage of the permits issued. By and large, soil conditions in the majority of the State lend themselves to conventional system installation and this type of system will continue to be the primary permitting option utilized by property owners. However, where soil conditions are marginal or non-permittable by current standards and development pressure is relatively high, GWP anticipates ATSDD systems to be an option evaluated by some property owners or prospective buyers. In areas where development pressure is low, the expense of an ATSDD system will likely result in a prospective property buyer seeking out a lot that can be permitted by conventional standards. The adoption of ATSDD technology will not result in every lot being permittable. However, the technology will allow for a larger percentage of the soil types in the State to be utilized for SSDS installation.

Any type of wastewater treatment/disposal system requires maintenance. Conventional SSDS benefit from solids removal from the tanks. Also, conventional systems consisting of alternating disposal fields benefit from periodically redirecting the flow from one disposal field to another. As SSDS become more complex, as in LPP systems and mound systems, the importance of maintenance increases and the impact of no maintenance becomes more apparent. Filtration of the effluent being directed to these types of systems significantly reduces the presence of suspended solids in the waste stream and reduces the potential for clogging of orifice openings in the distribution system.

Malfunctioning systems can be a result of a number of variables including soil type, and construction of the system. Volume of waste generated and degree of maintenance are also

variables that factor into the performance and longevity of a SSDS. Soil type and system construction are variables that can be controlled at time of permit issuance and construction inspection. Volume of waste generated and degree of maintenance are variables that factor in subsequent to a SSDS being used and largely can only be controlled by the user/owner of the SSDS. Historically, GWP has had little regulatory presence in the interval between SSDS construction and a situation of noncompliance with sewage disposal law.

Utilization of ATS necessitates regular maintenance to ensure the appropriate effluent quality standards are met and that the impact to the drip disposal system is minimized. To this effect the legislature has addressed the issue in TCA 68-221-417: "Failure of a property owner to conduct operation and maintenance as required by 68-221-415 and 68-221-416 or to maintain an operation and maintenance contract for an ATS shall constitute an offense punishable as a Class C misdemeanor." TCA 68-221-415 is a statute passed in the year 2000 that outlined a two-year pilot project study designed to allow ATS to be permitted and to assess the capabilities and performance of ATS in the State. TCA 68-221-416 (enacted the same year) outlines the requirements for the installation and operation and maintenance of ATS installed in the State.

GWP issued permits for two ATS through the structure of the pilot project study. Unfortunately, with only two ATS installed (per the standards outlined in the study) the results of the study were inconclusive. The soil area and suitability requirements to support permit issuance under this study required the property to have between 80% and 90% of the soil area necessary to support a conventional or alternative SSDS, and as a result there was little incentive for property owners to invest in that type of technology. However, GWP has applied ATS technology outside of the context of the pilot project study, primarily to effectuate repair of failing conventional systems with no other repair option or other situations with extenuating circumstances.

The performance of these systems is summarized in Appendix B.

The law assigns the primary responsibility for the maintenance of an ATS to the property owner:

1. TCA 68-221-415(a)(7): "The participating authorities shall perform operation and maintenance on any ATS during the term of the study in the event the **owner** and the manufacturer fail to perform operation and maintenance...";
2. TCA 68-221-416(a): "...the **owner of the property** shall perpetually operate and maintain it (ATS) properly." This section proceeds to state: "A technician certified by the manufacturer shall perform this operation and maintenance on the ATS."
3. TCA 68-221-417: "Failure of a **property owner** to conduct operation and maintenance as required by 68-221-415 and 68-221-416 or to maintain an

4. Rule 1200-1-6-.12: “It is the **property owner’s** responsibility to maintain the system (SSDS) in a safe and sanitary manner.”

GWP anticipates that a “maintenance provider” industry will develop within the State subsequent to adoption of these rules. The following briefly describes the manner in which GWP believes this industry will evolve. In part, this perspective is formed through discussions with manufacturers and academics, and in reviewing other state’s processes and federal regulatory guidance documents.

As stated previously, there are approximately 34 companies that have products that are NSF Standard 40 certified. Heretofore, due to the lack of permitting options specific to treatment technology these companies have previously perceived Tennessee to be a “nonmarket”. With the adoption of the proposed rules this will change: Tennessee will become an open market – with respect to units with NSF Standard 40 certification and that have met the State’s approval criteria. GWP anticipates that a portion of these companies will begin to cultivate individuals within the State to serve as representatives of their respective product. These individuals will likely, but not necessarily, be from associated industries, such as installers, engineers, soil consultants, and sewage disposal system consultants. Public/private utilities or wastewater authorities that are currently supporting multi-home decentralized systems may also chose to compete in this market.

NSF Standard 40 requires the manufacturers of these products to provide maintenance on their products for 2 years following installation. The typical model by which manufacturers achieve this on-site activity is by establishing a local representative. Each manufacturer will likely have its own business model by which it establishes a local presence and ensures that the ATS are being installed and maintained in accordance with manufacturer’s specifications. The State, through this proposed rule change, also intends to have an independent approval program for ATS maintenance providers and drip system installers.

GWP proposes the following requirements for the purpose of owner awareness, buyer notification, permitting, construction and maintenance associated with ATS:

1. Suitability of the site must be demonstrated through acceptable soil properties, soil conditions and topographical characteristics. This requirement is evaluated subsequent to the preparation of an extra-high intensity soil map and pit profiles.
2. Subsequent to application for an alternative SSDS, staff will use the soil map and pit profiles in conjunction with a site visit to determine whether an ATSD permit can be

issued for the property. Suitability for permit issuance will be documented in the form of a field activity report.

3. Based on consultation with the GWP local environmental specialist, the property owner will decide whether a “packaged” ATSD system or a site specific engineered design is necessary. The property owner will be provided lists of: NSF Standard 40 approved ATS; all approved ATSD system “packages”; and, state-approved maintenance providers along with their product affiliation.
4. At this point in the process the property owner is responsible for: establishing a contract with a manufacturer/maintenance provider ensuring a minimum of 4-years of maintenance in accordance with the manufacturer’s maintenance specifications, and amending the deed for the property to reflect that the residence constructed on the property is to be served by an ATSD. This deed amendment shall also communicate, per TCA 68-221-416, that the owner of the property is responsible for perpetual operation and maintenance; and, that failure to maintain an operation and maintenance contract is punishable as a Class C misdemeanor (TCA 68-221-417). The current statute mandates that the manufacturer execute a four-year operation and maintenance contract with the owner of each ATS sold and installed. The costs of such contract shall be included in the original price of the installed ATS.
5. Upon demonstration of a contract with a manufacturer/maintenance provider and amending the deed (Appendix C) as specified, GWP will issue a permit for construction of an ATSD. This permit will specify what stages of system construction are to be inspected by a GWP representative.
6. Installation of the ATS must be conducted by the manufacturer or authorized representative of the manufacturer and must conform to all manufacturer specifications and State permit and regulatory specifications. Installation of the drip disposal system must be performed by an individual permitted to perform this type of system installation by the State.
7. Subsequent to system installation and construction approval, the owner of the property shall perpetually operate and maintain the ATS. This requirement shall “run with the land” and be binding upon all future owners of the property.
8. The property owner is required by statute to maintain an operation and maintenance contract for the ATS. GWP proposes the combination of two mechanisms by which ATS operation and maintenance is tracked: telemetry and annual reporting by approved maintenance providers. Per the proposed regulations, all ATS installed in the State are to be equipped to participate in NSF’s web-based onsite monitoring

program (or comparable service) as purchased from NSF by the maintenance provider. The monitoring program must provide the following:

- a. Independent, third party verification that ATS are regularly serviced and maintained.
- b. Immediate, automatic notification of alarm activation to maintenance providers, maintenance entities, and regulatory bodies through cell phone, pager and/or e-mail.
- c. Direct internet access to a secure database for every monitored system, which tracks and records all inspection, maintenance and alarm activity.
- d. Ability for property owners, maintenance providers, maintenance entities, and regulatory bodies to track when service/maintenance is scheduled or overdue, and when service contracts will expire.

Maintenance providers will be required to submit a \$50 processing fee annually on the anniversary of the date of the certificate of completion for each system that the provider has under contract. The maintenance provider is responsible for reporting to GWP any failure of contract extension or breach of contract by the property owner within 30 days of the maintenance provider's receipt of this knowledge.

GWP proposes to maintain a database of all permits and subsequent installation of ATSDS systems. This database will include, at a minimum, the location of the ATSDS, date of permit issue, date of installation approval, ATSDS system type, maintenance provider name and address and date of annual renewal. Within 30 days of the anniversary of the certificate of approval for a particular system, the maintenance provider must submit a copy of the new contract along with a \$50 processing fee. Failure to do so will indicate one of the following:

1. The property owner failed to renew the contract with the maintenance provider and as a result the maintenance provider is no longer responsible for the system maintenance; or,
2. The maintenance provider is still under contract with the property owner to maintain the system but elected to not submit the processing fee.

In the first scenario, the property owner will be sent a Notice of Violation regarding failure to maintain a service contract. Continued failure of the property owner to establish a contract with a maintenance provider will result in the issue being forwarded to the local district attorney for prosecution.

In the second scenario, the maintenance provider will receive a disciplinary action letter announcing that failure to submit the appropriate processing fee may result in the suspension or revocation of his maintenance provider approval.

ATS Maintenance Provider Approval

As part of this rule change proposal, GWP is seeking to develop a program for those individuals that elect to become approved maintenance providers for ATS and drip disposal systems. For a person or company to market services of this type in the State a maintenance provider approval must be obtained. Obtaining this type of approval involves the following:

1. Making an application for the approval in writing and paying the associated fee.
2. A high school education or equivalent.
3. One year of full time work experience with ATSDS systems or related field as determined by GWP.
4. Attendance and completion of a training course established/approved by GWP.
5. Passing (80% correct) a written test developed/approved by GWP.

The training course to be utilized by GWP is “Residential Onsite Wastewater Treatment Systems: An Operation and Maintenance Service Provider Program⁽⁶⁾” established by the Consortium of Institutes for Decentralized Wastewater Treatment. GWP intends to utilize Dr. John Buchanan of the Center for Decentralized Wastewater Management, Biosystems Engineering and Soil Science, University of Tennessee, for the purpose of maintenance provider approval and drip disposal line installation training. The textbook to be used in support of this training is approximately 270 pages in length and addresses the following subjects:

1. Introduction to the concept of an “O&M Service Provider”
2. Personal safety associated with being a service provider
3. Business and Industry Ethics
4. Site Assessment
5. Pretreatment Components - Tanks
6. Pump Tanks, Pumps and Controls
7. Pretreatment Components – Advanced
 - a. Single-Pass Media Filters

- b. Recirculating Media Filters
- c. Aerobic Treatment Units
- d. Constructed Wetlands
- e. Lagoons
- f. Disinfection

8. Final Treatment and Dispersal Components

Coursework and testing for maintenance provider approval will span three consecutive days with a separate course and testing for drip disposal line installation on the fourth day. The two classes will result in independent approvals.

Maintaining maintenance provider approval will be a process of achieving 6 professional development hours (PDHs) per year and annual renewal with associated fee.

Maintenance Provider Responsibilities

Any maintenance provider approved under this proposed rule shall be responsible for renewing the annual operational permit referenced in the deed of the property and paying the appropriate processing fee for each ATS, SDD, or packaged system that the provider has under an operation and maintenance contract and the NSF (or comparable) web-based onsite monitoring program. Proof of maintenance contract and associated processing fee shall be due on the anniversary of the certificate of completion of the system.

In the event that a property owner chooses not to renew an operation and maintenance contract with a maintenance provider, the maintenance provider shall notify the Department within 30 days of such action.

Any maintenance provider approved under this section will be responsible for obtaining at least 6 Professional Development Hours (PDH's) annually. Courses qualifying as having PDH's will be approved by GWP.

Maintenance providers shall be responsible for notifying GWP of any condition, event, or failure of an ATS, SDD or packaged system that is outside the parameters of routine operation.

Operation and maintenance visits shall be conducted by the approved maintenance provider. Any individual making such visits shall meet the requirements of this section.

Drip Disposal Installer Certification

A permit allowing an individual to provide installation services associated with drip disposal systems may be obtained by the following:

1. An application with appropriate fee shall be submitted.
2. Attending a training course specifically addressing drip disposal line installation developed/approved by GWP.
3. Scoring at least 70% correct on a written test developed/approved by GWP.

Supporting Information

The following questionnaire was generated and emailed to all 50 states and some Canadian provinces:

"The State of Tennessee Department of Environment and Conservation, Division of Ground Water Protection is currently proposing a rule change to allow for the incorporation of secondary treatment technology and drip dispersal technology for private, single-family type on-site sewage disposal systems. This nation-wide questionnaire has been generated to compile information relating to other state's programs and their application of this technology. If you have recently responded to questions of this type from the State of Tennessee please do not respond. Thank you for taking the opportunity to review and answer these questions.

The following questions pertain to individual on-site systems serving a single structure:

1. Are secondary treatment units permitted with respect to individual on-site systems?
2. If these types of units are permitted, are they limited to National Sanitation Foundation Standard 40 approved systems?
3. Does the state provide installation and/or operator-maintenance provider certification specific to this type of technology?
4. Does the state require installers and/or operator-maintenance provider certification in addition to the manufacturers' certification?
5. Does the state require the homeowner maintain a contract with an approved maintenance provider subsequent to, or in addition to, the manufacturers' warranty?
6. If so, what is the frequency and mechanism of renewal?
7. Is there a penalty for failing to have a contract in place with a service provider?
8. Is the deed for a property changed to reflect that the property is being served by a system requiring a service provider contract?
9. Is drip dispersal an option for effluent distribution?
10. Is secondary treatment of septic tank effluent a necessary prerequisite for drip dispersal?
11. Is secondary treatment utilized prior to disposal through any other type system?
12. If so, is there any reduction in footage or any other modification made to the dispersal field based

on secondary treatment?

13. Has the implementation of this technology (secondary treatment and drip dispersal) been successful with respect to your program?
14. If not, for what reason(s) do you think it was not successful?
15. How long has this technology been permissible through the state's program?
16. Does the state approve "package" type systems?
17. Is an engineered design required for application of this technology?"

The results of this effort are presented in Appendix D. Fifteen states responded to this email questionnaire. The following is an overview of the results:

Question 1. All fifteen states permitted the use of secondary treatment associated with single family on-site sewage disposal systems.

Question 2. Nine states limited the application of this technology to systems with NSF Standard 40 approval. North Carolina indicated that NSF 40 (or better) was their standard. Five states did not utilize NSF 40 as a limitation for use.

Question 3. In response to whether the state provides installation and/or operation and maintenance provider certification in addition to the manufacturer's certification the response was varied. Three states responded with a clear "yes". Two others responded "yes" in that additional certification was (or may be) required at the local (county) level. Ten states had no state provided operation and maintenance certification program. However, Virginia indicated that it was due to have this requirement by 7/1/09. Mississippi also indicated that this was proposed in their upcoming rule change. No state indicated that "utilities" were required to provide service to these type systems.

Question 4. With respect to whether there is operator and maintenance provider certification required in addition to the manufacturer's certification, Florida and North Carolina were only two states responding in the affirmative.

Question 5. Ten states responded that they require the homeowner maintain a contract with an approved maintenance provider subsequent to, or in addition to, the manufacturer's certification. Five states did not have that requirement in place. However, Virginia indicated the requirement would be in place 7/1/09. Mississippi also indicated that this was proposed in their upcoming rule change.

Question 6. Of the ten states that responded “yes” to Question 5, two did not have a frequency or mechanism for renewal. Seven of the ten indicated a frequency of renewal ranging from 6 months to 3 years. North Carolina bases the frequency and mechanism for renewal on the type of technology that is used.

Question 7. Seven states responded that they did have a penalty for failure to have a contract in place with a service provider. Seven states clearly responded “no” or “not applicable”. Washington indicated whether there was a penalty in place was up to the local authority.

Question 8. Eleven states do not require that the deed for the property reflect that the property is served by a system requiring a service contract. Iowa indicates that the decision is made by local government. Idaho indicated “yes” and then qualified the answer with “somewhat”.

Question 9. Thirteen states allow drip disposal as an option for effluent disposal. Montana responded “NA”. New York indicated “No”.

Question 10. With respect to whether secondary treatment is required prior to discharge through drip disposal lines, seven states responded “no”. Seven states responded that it was a requirement and Montana responded “NA”.

Question 11. Secondary treatment is utilized prior to discharge through other types of systems in twelve states. One state indicated “no”, one state did not understand the question and one state indicated that this concept was being proposed.

Question 12. Based on their responses, all states appear to allow some reduction in footage or other modification made to the disposal field based on secondary treatment.

Question 13. With respect to the question of whether secondary treatment and drip disposal technology has been successful to their program the response was varied. Four states clearly indicate “yes”. Three states responded with “somewhat” or “some areas”. Five states indicate “unknown”. Montana indicated “NA”. Mississippi indicated “No” but qualified the answer based on the first attempt to implement the technology. They attributed the lack of success to the fact that the technology was introduced through the legislature without the benefit of a body of regulations to dictate how the technology was to be implemented. Their current regulations have been constructed to address the earlier shortcomings.

Question 14. This question basically became a reflection of the “problems” associated with that element of their program. Five states did not state an apparent problem. Three states indicate a lack of maintenance companies. Washington referred to lack of state

oversight. Massachusetts referred to installation problems. Maine referred to cost as problematic. Mississippi indicated legislative difficulties and filtration devices used by some manufacturers.

Question 15. When asked how long their programs have permitted this technology the answers ranged from 3 years to 26 years.

Question 16. Nine states approve the use of “package” type systems, four states do not. Two states did not understand the question.

Question 17. Seven states responded that engineered design was necessary in support of this type of technology. Five states do not require an engineered design. Two states require an engineered design based on daily design flow (if greater than 1,500 or 2,000 gallons per day). One state did not understand the question.

In addition to the questionnaire, direct calls were made to peers in other state governments to gain insight to their practices and results associated with secondary treatment system maintenance. The following summarized these conversations:

Alabama – Alabama has no mechanism of enforcing maintenance subsequent to the two years of maintenance required as a NSF Standard 40 approved system. The state does have an installer training program but no operator training program. The person contacted had no reports of problematic systems at his position but commented that other information may be available at a local level.

Delaware – GWP’s recent discussion with a representative of Delaware’s Division of Water Resources identified their program as a clear success. However, the program’s current success was only achieved through trial and error as described below.

As of April 2005, Delaware had permitted approximately 600 systems of the type discussed in this paper. A lengthy discussion was conducted regarding the state’s model of operation and maintenance for ATS. When their program implemented this technology (1993) they did not have in place a mechanism for ensuring that the systems be operated and maintained. In 1999 and 2000 the State made attempts by sending letters to all permittees of these type systems announcing that a State fee was necessary in order to support an inspection by the State to insure the systems were being maintained. This effort was not successful due to lack of legislative and regulatory support. In 2004 and 2005, the State prioritized the need to inspect each of the systems that had been installed. In 2004, 33% of the compliance inspections encountered problems, and in 2005 an estimated 50% of the compliance inspections encountered problems. Problems included advanced treatment units and disposal systems being

turned off, broken blowers, clogged filters, bad solenoids, excessive use, dismantled parts, bad floats, timer tampering, improper pumping frequencies, and etc. Staff also reported lack of awareness by homeowners who didn't realize that they had a septic system or the importance of operation and maintenance. In a paper provided to the State of Tennessee, Delaware summarized the problem per the following:

"The problem is simply that DWR lacks a required O&M policy for IA (ATS) systems. It has become apparent that a lack of funding and continued staff shortages for several years has caused the DWR to fall short in their quest to monitor and track the performance of IA systems. Current inspection results have proven that homeowners are not educated enough, or interested enough in ensuring the proper operation and maintenance of their systems. If we continue at this rate, the intent and effectiveness of these systems will be wasted, and we will lose support for an increase in environmental protection, valuable land, money, manufacturer interests and time. The only logical way to prevent the degradation of the IA systems is to adopt an O&M policy and include permit conditions with IA system permits."

To address the problems described above, Delaware implemented an O&M policy based on an existing regulation. This regulation states that the permit for an alternative treatment system shall: "(a) Specify a method and manner of system installation, operation and maintenance." The fundamentals of this policy are listed below:

1. The required O&M of all IA systems shall be required through maintaining permit conditions which require service contracts with certified maintenance providers.
2. Prior to the Certificate of Completion being generated, the permittee must provide a service contract with the manufacturer, or their local representative, for a minimum of two years starting at the date of completion and/or initial use of the system. In the initial two-year contract the manufacturer or the designee must inspect the facility once every six months or per the manufacturer's request. The contract shall outline the routine inspection frequency, inspection details, operation and maintenance activities necessary, and any sampling if required. If wastewater is not applied to the system immediately after final construction inspection, the period must extend until the system has been in service for two years.
3. Following the initial two-year period the permittee is required to continue with operation and maintenance by renewing the existing contract at a minimum of annually or be contracting with another certified maintenance provider. Unless

manufacturer guidelines are more stringent, an annual inspection frequency will be required after the initial two-year period.

4. The permittee is responsible for submitting all inspection reports and updated contracts by March 30th of each year.
5. Prior to the purchase of a dwelling that utilizes an advanced treatment unit, the prospective buyer must enter into a service contract with the terms and conditions associated with the use of the advanced treatment unit. The new owner must submit a copy of the service contract to the Department.

Delaware's Department acknowledges that they must perform their own compliance inspections as a quality control measure to compare to the submitted inspection evaluation. Their Department has elected to not apply a fee for their services.

Iowa – Iowa's representative clearly described their program as "works well" and are considering placing even more types of systems under the same maintenance model that they have developed for ATS. He estimated the number of systems installed in the thousands.

Iowa's maintenance model utilizes private contractors certified by the manufacturer to provide the necessary maintenance for the systems.

State code requires perpetual maintenance and annual renewal; however the counties are responsible for enforcement. Iowa does require systems be approved under NSF 40 Standard.

Issues of concern are lack of private contractors and issues of property owners not paying their maintenance provider because they did not see the maintenance provider performing maintenance.

Michigan – Michigan has a county-based program what was qualified as being successful. They require NSF Standard 40 approval and manufacturer-based training and certification.

GWP was provided with requirements adopted by one of their counties (Livingston) that was considered as having a good program. Notable elements of their maintenance/service contract program are as follows:

1. Offsite remote monitoring is required for the lifetime of the system.

2. Initial one-year contract with a certified maintenance provider (certified by the manufacturer).
3. Annual renewal of the contract or a new contract with a maintenance provider. Evidence of such is to be submitted to the Department of Public Health.
4. A permit agreement is to be filed with the Register of Deeds before a permit to install the system will be issued.
5. A deed restriction must be filed with the Register of Deeds prior to completion of the septic permit.
6. As part of the permit agreement the property owners are responsible for renewing an “operating permit” from the Department of Public Health on an annual basis and pay the associated fee. As part of the “operating permit” process, the Property Owners shall be required to document to the Department of Public Health that an OM contract has been executed for the current annual period.
7. If the Property Owners fail to renew their “operating permit”, the Department of Public Health shall provide the necessary inspections of the system by a qualified OM provider, and charge the Property Owners for this service plus an additional fee for non-compliance.
8. If the Property Owners do not renew the “operating permit” for a period of two consecutive years, the on-site sewage treatment system shall be considered in non-compliance, for which the Property Owners shall be guilty of a misdemeanor and subject to civil penalties of up to \$1,000 for each violation or day that the violation continues.
9. This agreement is designated as permanent and to run with the land, and shall be assigned to future owners of the Property unless the Property is connected to a public sanitary sewer.

Pennsylvania – The Pennsylvania representative indicated that the type of ATS system used in Pennsylvania was primarily biofilter with a few aerobic type systems. He indicated that the program was “all in all” a positive element to their program. The manufacturer is largely the depended upon to provide system maintenance. Also, he cited an inherent difficulty in that Pennsylvania is a “commonwealth” state and the programs are left to the local authority. As a result there are approximately 200 different programs across the state. He recommended that a program should specify NSF

Standard 40 approved ATS, along with third party verification of maintenance and a renewable operating permit.

Virginia – Virginia’s representative categorized their program involving ATS-type technology had been successful. The state requires that the property owner maintain a contract with a maintenance provider at all times. However, there was nothing in place to ensure that the contract was being maintained. Private maintenance providers are used.

Wisconsin – Wisconsin’s representative referred to their program as being “robust”. There are approximately 500 maintenance providers in the state and units from approximately 12 manufacturers being utilized. This aspect of their program began in 2000. The “down side” to the experience gained by Wisconsin is with respect to follow-up renewals of contracts which he accredited to non-educated property owners.

U.S. EPA Voluntary National Guidelines for Management of Onsite and Clustered (Decentralized) Wastewater Treatment Systems⁽⁷⁾

The U.S. EPA has developed guidelines for management of onsite wastewater treatment systems. These guidelines are identified through 5 management models. The models are provided as conceptual approaches with progressively increasing management controls as sensitivity to the environment and/or treatment system complexity increases. The purpose of the models is to provide a guide to match the needed management controls to the potential public health and water quality risks presented by decentralized systems in a particular area. As stated in the executive summary to this document: “The “best” model program for a community is not necessarily in the highest levels, but rather is the model that provides the most appropriate management controls for the potential risks.” Also, “it is possible to implement more than one management program model within a jurisdiction as appropriate for the circumstances encountered...”.

Management Model 1 is referred to as the “Homeowner Awareness” model and it deals with systems that are owned and operated by individual property owners in areas of low environmental sensitivity. This type of model is considered adequate where treatment technologies are limited to conventional systems that require little owner attention.

Management Model 2 is referred to as the “Maintenance Contract” model and it is recommended where more complex designs are employed to enhance the capacity of conventional systems to accept and treat wastewater. Because of treatment complexity, contracts with qualified technicians are needed to ensure proper and timely maintenance.

Management Model 3 is referred to as the “Operating Permit” model and it applies where sustained performance of treatment systems is critical to protect public health and water quality. Limited-term operating permits are issued to the owner and are renewable for another term if the owner demonstrates that the system is in compliance with the terms and conditions of the permit.

Management Model 4 is referred to as the “Responsible Management Entity (RME) Operation and Maintenance” model. This model specifies program elements and activities where frequent and highly reliable operation and maintenance of decentralized systems is required to ensure water resource protection in sensitive environments. Under this model, the operating permit is issued to a RME instead of the property owner to provide the needed assurance that the appropriate maintenance is performed.

Management Model 5 is referred to as the “RME Ownership” model. This model specifies that program elements and activities for treatment systems are owned, operated, and maintained by the RME, which removes the property owner from responsibility for the system. This program is

analogous to central sewage and provides the greatest assurance of system performance in the most sensitive of environments.

Model 1 is currently the standard with respect to systems authorized through GWP. Model 3 most closely describes the manner in which GWP intends to implement ATS technology to single-family, privately owned systems and accomplish the necessary operation and maintenance of these systems.

Summary

Extensive consideration, discussion and evaluation of the impact of introducing ATSDS systems as a permitting option for property owners in the State have transpired over the last several years. GWP has involved academia, manufacturers, maintenance providers and regulators in these discussions.

The capability of drip disposal to effectively distribute liquid over a given area is not disputed, to the knowledge of GWP, and has been widely utilized in Tennessee as well as other states. Likewise, the ability of an ATS to achieve a much higher quality waste than a septic tank is not disputed and is widely used across the country. Why then has the State been reluctant to implement this technology? Quite simply the issue involves insuring that the systems are maintained. It is clear, as a result of discussions with other states that have allowed this technology to serve single-family structures for years, that system maintenance is the key to a successful ATSDS system program. Can this be achieved through a model of independent maintenance providers? Overall the answer from other states is "Yes". And, as would be expected, the stronger a state's maintenance program - the more emphatic their "Yes" response.

Through discussions with other state's personnel and review of documents associated with their programs, a number of practices were identified that are linked to the degree of success of the individual program. These practices can be summarized as the following:

1. NSF Standard 40 certification of ATS implemented in the state.
2. Maintenance providers authorized by the manufacturer of the ATS.
3. State approval program for maintenance providers in addition to manufacturer certification.
4. Drip disposal line installer certification.
5. Deed amendment reflecting the presence of an ATS and the responsibility of the property owner to perpetually maintain the system.
6. Telemetry-based monitoring.
7. Demonstration of annual maintenance contract renewal.
8. System and contract tracking by regulatory authority along with periodic site walkthroughs to verify system performance.

9. Mechanism of enforcement for noncompliance (failure to maintain a maintenance contract).

No one state interviewed contained all the above-listed elements in their respective program. However, GWP (Tennessee) does include all of the above-listed elements in the regulation change proposal. As with any program (new or old) there will undoubtedly be difficulties. This will be the case as the program evolves in Tennessee as it has in other states. As discussed with other states, all referenced this component of their program as successful and all referenced problems they had encountered and addressed or were in the process of addressing. Also, several conversations were more than pointed in that they encouraged GWP to consider implementing certain things that in hindsight they wished they had implemented. GWP considers this regulation change proposal to represent the best model available for the successful implementation of this technology within the State of Tennessee.

Alternate Maintenance Model Considerations

GWP unveiled our initial model for ATSDS permitting, construction and maintenance in a November 2007 draft regulation change proposal submitted to the Secretary of State's office. Subsequent public comments, associated with the ATSDS portion of this proposed rule change, identified only one primary objection to the model proposed by GWP. This objection did not pertain to the technology associated with drip disposal or capability of advanced treatment systems to obtain an improved quality of effluent. Instead, the objection was made in reference to the maintenance model proposed by GWP. The entities opposed to the maintenance model proposed by GWP suggest an entirely different model be implemented by the State to achieve maintenance of the ATSDS systems.

The model proposed by the opposing entities is based on the concept of "exclusivity". Their proposal suggests GWP modify their rule change proposal in one of two ways:

1. ATSDS system technology should not be allowed for permit issuance unless a public utility, utility district, or wastewater authority is in place to not only maintain the system but also to own the system.
2. Public utilities, utility districts, or wastewater authorities should have right of first refusal of ownership and maintenance at any location this technology is utilized.

The arguments posed to support the "public utility" model include reference to:

1. The requirement for property owners to maintain a contract with an authorized maintenance provider will be a "hassle" for homeowners.^(a)
2. It will be "hard" or "difficult" to get homeowners to cooperate.^(a,b)
3. It will be an "additional expense" that "most people" will "reluctantly" or "not willingly" want to pay.^(a,b)
4. If the systems are owned and operated by Authorities, Municipalities, Public Utility companies, or Utility Districts "reliable" and "dependable" service would be provided.^(a,c)
5. Residents would pay for the service through sewer fees; therefore, it would "seem" less of a financial burden.^(c)

6. If the resident did not pay the fee the utilities would “cut off their water”.^(b,c,e,f,g) This model is suggested to be “less likely to get in any legality issues.”^(d)
7. Compliance issues would be the responsibility of the “utilities” or “companies.”^(a,b,f) And, “Since the utility districts, public utility districts, and municipalities are already in compliance with TDEC regulations, and have the ability to maintain these types of systems it would make the most sense to put the responsibility on these companies.”^(d) This commenter goes on to state: “These types of companies will provide our residents with consumer protection because they are not regulated public utilities or government agencies...” And, “This change to the proposal will bring beneficial money to maintaining and operating the treatment systems.”
8. They are “not aware of”^(f), of any state where GWP’s proposed model has been successful. They have “heard of”^(c) states “that have tried similar programs and do not know of any that have been successful.”^(c) Also, “There have been many instances in which other states have tried similar systems and all seemed to have failed.”^(d) “All states that have adopted this type of stop-gap management have consistently found this to be an unenforceable program.”^{(g) (f)}
9. Homeowner’s refuse to pay for services that they do not “see” rendered.^(c)
10. All the fees would go to Ground Water Protection to “increase their revenues since their number of permits has gone down over the past few years.”^(c) “The apparent attempt is to generate a significant tax increase in the form of fees to GWP.”^(f)
11. “This type of system will require a large staff to keep things in order and homeowners in compliance with everything.”^(d)
12. The GWP proposal requires “quarterly testing.”^(b) “The requirement for quarterly testing is likely to prevent installation of many of these systems.”^(g)
13. “The draft regulations propose to allow certified maintenance providers to be hired by homeowners on an at-will basis.”^(g)
14. The proposal is “creating a model with no clear ‘entity’ to be responsible for compliance.”^(g)
15. “Utilities are in a perfect position to deliver this service to the citizens of Tennessee.”^(g)
16. “Allowing a multitude of service providers in a small geographic area essentially creates a very inefficient maintenance program.”^(g)

17. "Service providers can never rise to the same level of service." ^(g)
18. "The annual cost to the homeowner for the operation and maintenance and to pay GWP the required annual permit fee and inspection fee will result in \$1,000 - \$1,500 per year." ^(f)
19. "Sand filters are not recognized as ATS systems by the regulations and, therefore, cannot be used with drip dispersal." ^(f)
20. "I find no legislative authority for GWP to require such a contract nor for GWP to impose such costs on the homeowner, thereby denying them the right to obtain alternate prices from other service providers not associated with the ATS manufacturers." ^(f)
21. Comments 1 -5 and 8 from Mike Hines in letter dated May 16, 2008, do not pertain to the rule change proposal.
22. "No scientific or engineering justification has been presented that would completely disallow drip effluent dispersal of highly treated effluents in some soils. Some lower loading rate is always available." ^(f)
23. "Judges are very sympathetic to the homeowner's plight and are very reluctant to punish the homeowner." ^(f)
24. "there are numerous places in the regulations where a variation of the following language appears 'as determined by the Commissioner (or Division , or staff etc.)'...Any such language or authorities should be stricken from the draft regulations or specific regulations written..."^(f)

GWP offers the following response to the arguments listed above.

1. A prospective buyer of a lot in an approved subdivision that was approved based on ATSDS technology will be made aware of same by language on the plat. Also, at time of permit issuance, the property owner will be made aware of the responsibilities associated with an ATSDS system. This notification will be in the form of a permit agreement and deed amendment. At no point will a property owner be forced to install a system of this type. If a prospective property owner does not want the additional obligation that comes with an ATSDS system then undoubtedly they will pursue purchase of a property that can be permitted independent of this technology. Rather than the maintenance provider model being forced on a property owner, it will be a property owner's option whether to purchase a property where this will be required. Entities contesting the GWP proposal gain unwarranted notice by

- suggesting that GWP is now going to require property owners to maintain a contract with a maintenance provider. This will only be for those properties where the ATSDS system technology is implemented. If an individual owns property that cannot be permitted based on current standards but can be permitted based on ATSDS system standards, the ability of the property owner to obtain a permit will likely result in an appreciation of the fact that more options are available.
2. Getting “everyone” to cooperate in anything is difficult. Getting all utilities to “cooperate” would be difficult as well. The statutory mechanism for addressing “any person violating any provisions” of GWP rule and regulation is through the district attorney general in whose district a violation occurs. This process has been an effective control throughout the history of GWP. In instances where an ATS is utilized and the property owner fails to maintain an operation and maintenance contract (T.C.A. 68-221-417), a Notice of Violation will be sent to the property owner outlining the violation and the steps necessary to correct the violation and the timeline associated with compliance. The involvement of the district attorney general will be clearly outlined as a consequence of failing to comply. Historically, very few Notices of Violations have to be forwarded to the district attorney general for prosecution. However, when this does occur it is processed in the form of a criminal summons. The summons is delivered to the appropriate individual and identifies the date and time the individual needs to appear in General Sessions court. On this day the judge hears the issue from the individual’s perspective and the district attorney general’s perspective and orders necessary actions to achieve compliance. Almost without exception, compliance is achieved between the time the criminal summons is issued and the court date. Often a call to the district attorney general announcing that compliance has been achieved will result in the case being removed from the docket. GWP has evidenced numerous occasions where the thought of going to criminal court, retaining an attorney, paying fines and court costs, and potentially incurring a Class C Misdemeanor charge on their record was sufficient to result in a violation being corrected. This process, while involved, is very real and is a very good deterrent to continued violation.
 3. “Most” people will not have the desire or necessity to have an ATSDS system on their property. None will be forced to utilize this technology. However, for those that elect to purchase or develop property where this technology is the only permitting option, additional expense is to be expected. To suggest that “additional expense” will not be incurred if implemented by a “utility” is not defensible. Those that do implement this technology will have to pay for maintenance whether through a private service provider or a “utility”.

4. Ownership and operation and maintenance by Authorities, Municipalities, Public Utility companies, or Utility Districts does not insure reliable service. See Response 17.
5. The suggestion is that the maintenance expense be absorbed or included in the form of an addition to the property owner's utility/sewer bill. However, if a property was not served by sewer, would not the property owner realize they were paying a fee for the ATSDDD that was serving their residence? Also, in the instance that the utility represents both water and wastewater services it is not realistic to assume that since the property owner is only making out one check they won't object to an additional fee for wastewater services.
6. "Cutting off the water" in the event someone did not pay their bill for ATSDDD maintenance service is realistic only when the wastewater service provider also provides property's water service or has an agreement with the water service provider that allows the wastewater service provider to cut off the water in the event of failure to pay the wastewater service provider bill. This may be realistic in some scenarios, however there are multiple scenarios where it is not. For example, if a property has a private water supply (well) the wastewater service provider would have no authority to disconnect the water supply unless the property owner signed an agreement to allow the utility to have exclusive right to a cutoff valve in the water line. Also, if the water service provider did not have a cooperative agreement with the wastewater service provider the wastewater service provider would have questionable authority to interrupt water service.
7. By T.C.A. 68-221-417, the responsibility for compliance rests with the property owner. There is no precedent in the history of GWP that identifies anyone other than the property owner as the responsible party for compliance with subsurface sewage disposal system law. Nor is there any precedent by which an individual or entity other than the property owner owns the subsurface sewage disposal system serving that property. System ownership by a utility is a very plausible and practiced concept for systems serving multiple properties; however, the same concept cannot be practically applied to individual systems permitted under subsurface sewage disposal system law.
8. GWP's research with respect to other government programs has been extensive and has included product manufacturers, certification providers (NSF), academia, and direct interaction with peers in other local and state governments. To date, GWP has not identified any "similar" program considered to be "unsuccessful" by the associated regulatory authority (See Pages 18 through 24). Comments submitted alleging failure with similar programs are unsubstantiated without supporting

- documentation. GWP's proposal is unique in that it incorporates all of the known successful traits of other programs. While there may be some other programs that are "similar", GWP is not knowledgeable of any that are the same.
9. Homeowners are no more or less apt to see a private maintenance provider performing their job than they are a "public utility" provider doing their job.
 10. As with all systems permitted by GWP, a fee is charged. The fee for an ATSDS system will be the same as for any other alternative system. An additional fee (\$50 per year) will be charged to the contracted maintenance provider for every system under contract with that particular maintenance provider. Undoubtedly this fee will be passed along to the property owner by the maintenance provider. This fee is necessary to support development and operation of a tracking system for ATSDS systems. Also, periodic site walkthroughs by GWP personnel are anticipated. As with earlier comment responses, these types of permits are not going to be issued instead of traditional permits; they are going to be issued where traditional systems cannot be installed and the property owner chooses to implement this ATSDS technology. A property owner is not going to pay more for a permit and system than he would have had to previously; if a traditional permitting option is available then the "traditional" expense is still what would be paid. ATSDS system technology will find its largest application in areas previously nonpermissible. However, application of ATSDS technology is expected to be minimal.
 11. GWP currently has adequate staffing to keep things in order and address property owner noncompliance with sewage disposal law. GWP does not anticipate the need for additional staff to add ATSDS system technology to our permitting options.
 12. Quarterly testing is not a required component of the maintenance model proposal.
 13. Property owners will not be "at will" to contract with a maintenance provider. Contracting with a maintenance provider is a statutory mandate and failure to do so is a "Class C Misdemeanor."
 14. The "clear entity" responsible for compliance is the property owner.
 15. While public utilities, wastewater authorities, and utility districts may be capable and may choose to provide this type of service, the majority of the state is not served by wastewater authorities, or utility districts. However, "public utilities" as recognized by TRA, can elect to provide their services anywhere within the State. And, considering that these "public utilities" are in fact profit-oriented private companies, the "public utility" proposal will position them to control this industry. Furthermore, since the

- TRA regulatory authority extends to “public systems” TRA will not have the authority to set prices levied by “public utilities” to private property owners.
16. Evidence is not provided to support why multiple maintenance providers in a small geographic area “creates” an “inefficient maintenance program.” GWP does not anticipate numerous maintenance providers to exist in an area whose sole source of income is associated with the maintenance provider industry. Instead, GWP anticipates that the bulk of maintenance providers will initially stem from engineers, soil consultants, installers, and septic system design consultants that are already associated with this industry. Furthermore, there are examples across the nation where individuals began providing the “maintenance provider” service to the public only to see it become their “primary” service. GWP’s model anticipates creating a competitive marketplace wherein a property owner has multiple technologies to choose from and multiple maintenance provides from which to choose. It should be noted that the private “public utilities” also provide design services, have ownership in tank manufacturing businesses, provide construction services, and own or represent companies manufacturing the components used in these systems. If the sole “public utility” maintenance proposal is adopted, the property owners will find that not only is their choice in maintenance providers predetermined, but so too will be the engineering service, construction service, component selection, and ownership of the private system located on their property.
 17. Quality of service and compliance can span the spectrum with “public utilities” as well as private maintenance providers. Evidence of noncompliance in the form of Notices of Violation prepared by WPC is public record, and instances of permit violations are available for public utilities, wastewater authorities and utility districts. Some violations associated with common treatment systems serving multiple homes include ponding of effluent to the ground surface, migration of effluent away from the disposal areas, drip area not fenced or posted, system components leaking to the ground surface outside of the fenced area, drip lines exposed to the surface of the ground, failure to submit Monthly Operation Reports (MORs), exceedances of permit limits involving treatment, failure to include necessary data in MORs, failure to submit necessary reissuance applications, and lack of vegetative management.
 18. On August 19, 2008, an informal inquiry was made of three manufacturer representatives/distributors (Quanics, Ecological Tanks, and Carolina Aerobic Systems) that market their systems and service through models similar to GWP’s model. Specifically, they were asked what the typical cost to a homeowner is for standard maintenance visits associated with ATS. Their responses for typical service were consistently in the vicinity of \$300/year and varied between \$150 per

- year and \$500 per year depending on the number of visits, system complexity, daily flow volume, and whether annual solids removal was included in the price. Participation in NSF's web-based onsite monitoring program costs \$24 per year per system monitored. GWP's revised rule proposal will include a \$50 per year tracking fee assessed to the maintenance provider for each ATS under contract. This fee will likely be passed to the property owner. As evidenced in the Water Environment Research Foundation paper⁽⁸⁾, the cost levied to the property owner through public utilities recognized by TRA is \$35/month and will be raised to \$60/month. At \$60/month along with an access fee of \$85 per year (evidenced through review of recent TRA tariff approvals) a total of \$805 per year would be charged for the public utility service. This amount is the amount charged to each residence of a multi-home decentralized system. GWP fully expects the fee charged, by a "public utility" to a user of a private system (designed for one household) to be more than that charged to each residence using a multi-home decentralized system.
19. GWP's revised proposal recognizes sand filters as appropriate treatment alternatives to precede drip disposal systems.
 20. Legislative authority for GWP to impose the requirement of a maintenance contract on the property owner where an ATS is being used is found in T.C.A. 68-221-417. A maintenance provider will have to demonstrate manufacturer approval to service a particular ATS. ATS technology is varied. Simply being certified by one manufacturer does not insure a maintenance provider's ability to service all ATS.
 21. No response is provided to these comments.
 22. This comment is true. Saying "concrete has an absorption rate" is also a true statement. The question becomes "what are the boundaries of designing in good conscience?" The standards for soil **suitability** for drip disposal are similar throughout the nation and preclude the use of minimally permeable soils such as some types of clays. The State has a responsibility to its citizens to permit systems that have a reasonable expectation of functioning safely. Also, there are a number of variables that factor in to the suitability of a site in addition to the texture or permeability of a soil. Based on texture some soils may allow for a high loading rate; however, if the soil is not well drained or has a shallow restrictive horizon directly under the permeable soil, the ability for the soil to accept effluent may be severely limited. Such conditions are site-specific and cannot be generalized.
 23. Judges are sympathetic to a homeowner's "plight." The failure of a property owner to pay for a service he is under contract to pay is not a "plight" – it is Class C misdemeanor. The "plight" more aptly recognized by a judge is the "plight" of the

maintenance provider or utility that does not get paid for services rendered. A property owner is not going to “all of the sudden” find that he is getting a bill for something he did not agree to pay. If the property owner is the original owner of the residence, he will have made the decision to purchase a property that required an ATSDS system; or, he would have been able to obtain a permit through the availability of this technology whereas he could not have obtained a permit previously. In either case he would have acknowledged the requirement for maintaining a service contract. If the current property owner purchased the home subsequent to the installation of the ATSDS, a deed search would have identified the property owner’s obligation to maintain an ATSDS system service contract.

24. State rules are written as specifically as possible; however, it is not possible to define within the rules every variable that may be encountered. In this light the Commissioner has the authority to grant variances from rule when, in the opinion of the commissioner such a variance will not violate the provisions of T.C.A. 68-221-401 or otherwise constitute a definite health hazard. The commissioner’s authority has been extended to the Director of the Division of Ground Water Protection. Variation from rule is considered only through a formal variance request and, if granted, is per the Director’s signature.

A common thread within the comments received by GWP from entities contesting our proposed model refers to wastewater authorities, public utilities, and utility districts synonymously. These entities are not synonymous nor do they have authority over subsurface sewage disposal systems permitted under T.C.A. 68-221 Part 4.

T.C.A. 68-221-602 is the statute that allows for the establishment of water and wastewater treatment authorities and states that authorities created pursuant to this statute are for “public and governmental purpose and a matter of public necessity.” GWP argues that the intended role for wastewater authorities extends to “public” systems serving more than one property. If a property owner has adequate suitable soil to install a system permitted under subsurface sewage disposal system law then that property owner is not in need of a “public” service. Furthermore, the powers of an authority to adopt regulations necessary to accomplish the purposes of the statute are limited to “nontraditional sewage disposal systems” (T.C.A. 68-221-607). As defined in this statute “nontraditional sewage disposal systems” does not include subsurface sewage disposal systems that are subject to the permitting requirements of part 4 of this chapter...” Per this statute, subsurface sewage disposal systems permitted by GWP are distinguished from systems over which a wastewater authority has power. T.C.A. 68-221-604 identifies the process by which a wastewater authority may be created. Included within the criteria is the determination “that the public convenience and necessity require the creation of an authority...” T.C. A. 5-6-120, regarding the responsibilities of county mayors relative to the

transfer of duties to water and wastewater authorities, identifies “public convenience and necessity” as the requirements for supporting a wastewater authority. These criteria further support GWP’s assertion that a wastewater authority is created for “public need.” As stated above, if a property owner has adequate suitable soil to install a system permitted under subsurface sewage disposal system law then that property owner is not in need of a “public” service. GWP does not consider the creation of a wastewater authority to be necessary to accomplish the appropriate maintenance of an ATSDS system, nor (based on the above-stated reasons) does GWP consider any existing wastewater authority to have dominion over private subsurface sewage disposal systems serving one property.

Public utilities, as referenced in the comments provided to GWP, refer to utilities recognized by the Tennessee Regulatory Authority (TRA) (T.C.A. 68-4-101). As defined within this statute, a public utility means “every individual, copartnership, association, corporation, or joint stock company, its lessees, trustees, or receivers, appointed by any court whatsoever, that own, operate, manage or control, with the state,” any system “...affected by and dedicated to the public use...” GWP argues that a permitted and installed ATSDS system will not be affected by or dedicated to public use. An ATSDS system, as defined in the GWP proposed rule change, is designed for the wastewater generated from a single household and is to be disposed of in an area either owned or under sole control of the property owner for which the system was designed. Furthermore, a “public utility” as defined by TRA is a private enterprise.

The role of public utility wastewater service providers in Tennessee has grown exponentially over the last several years due to the increase in “decentralized” systems permitted through the Division of Water Pollution Control (WPC). These systems are designed to serve multiple households and are composed of a collection system, treatment system and disposal system. The collection system consists of each home having what is commonly referred to as a septic tank. Effluent from each tank is directed to a common treatment area and, subsequent to treatment, the effluent is typically discharged to the soil via drip dispersal lines. Considering the “public” nature of these decentralized systems, GWP is in agreement with WPC in that a public utility, wastewater authority, or utility district own and operate the system. However, the assumption that since public utilities are approved to own and operate decentralized systems they are also a good fit for an ATSDS system serving one residence is not accurate. In defense of this position, GWP defers to Dr. John Buchanan with the Center for Decentralized Wastewater Management with the University of Tennessee. The following represents a synopsis of a recent conversation with Dr. Buchanan regarding this subject:

There are several perspectives by which this topic could be approached. On a fundamental unit process basis, individual treatment systems are ‘extended aeration plants’ and operate in the endogenous respiration phase of the microbial growth curve. This requires low organic loading and long aeration times. The vast majority of large

aerobic wastewater treatment systems use contact stabilization – which uses two separate tanks for wastewater treatment and activated sludge stabilization. Stabilized activated sludge is mixed with the influent wastewater in a contact tank. This allows more rapid oxidation of organic matter with an overall reduction in aeration time.

A second reason for the differences is that individual systems must treat all the wastewater in real time. Large plants have the advantage of dilution, mixing, and equalization in the vast collection system. Individual systems do not and thus must be able to handle shock loading.

An individual system service provider must be an expert in control systems, aerobic treatment and distribution hydraulics. Large plants allow for specialists – operators who understand pumps, treatment issues, or control systems. Only one person is going to maintain a small system.

Perhaps the most important distinction is that large treatment plant operators do not typically have a base of knowledge about soils and putting treated effluent into the soil.

As stated earlier, public utilities are approved to operate a system by demonstrating public necessity. If a property owner has adequate suitable soil to install a system permitted under subsurface sewage disposal system law then it is not necessary that the property owner depend on, or be forced to utilize, a public utility.

The TRA's authority to approve tariffs associated with public utility service extends to those systems for which a public need has been demonstrated. GWP questions whether TRA would have the authority to set rates for service provided to private systems if public utilities, as approved by the TRA, are given partial dominion over private ATSDD systems. A concern of GWP is that if "public utilities" are given the authority to own and manage private ATSDD systems, what authority would TRA have to regulate the fees charged to the property owner? While it is apparent that TRA serves this role with respect to public systems, it is not apparent that they would serve the same role with private systems thereby allowing the public utilities (private for-profit companies) to charge whatever they wanted to for their private system services.

The creation of "traditional" utility districts through T.C.A. 7-82-202(a)(1) identifies "public convenience and necessity" as the criteria for establishing a utility district.

The growth in "decentralized wastewater system" utilization across the State has produced an opportunity for private companies to provide public utility services. These companies own and provide maintenance for the majority of decentralized systems in the State. However, some are owned and operated by wastewater authorities and utility districts, albeit a distinct minority.

GWP considers the reason that the majority are owned and operated by private companies operating as public utilities to be two-fold. There are few counties that have created a wastewater authority; therefore, there is not an authority to own and operate the systems. Also, most utility districts elect to not extend their service areas to encompass the more distant areas where decentralized systems are being constructed or are not interested in providing that type of service. The argument that wastewater authorities, utility districts or public utilities have dominion over the ATSDS system type as permitted by GWP would appear to be somewhat veiled in its objective. By and large there are few wastewater authorities within the State and of those that are established only one has expressed an interest in owning and operating ATSDS systems serving private residences. Also, only two utility districts (Watts Bar and Consolidated Utilities) have provided comment on the proposed rule change. Private companies providing public utility service through the TRA are in the position of monopolizing the market associated with ATSDS if the rule change proposal is modified in the manner they suggest. GWP argues that the model that is currently proposed in our rule change and presented in this position paper would be detrimentally impacted by the “public utility” proposal in the following ways:

1. It is likely that the “public utility” through which a private property owner would be forced to interact would only agree to own and operate one or two types or brands of ATS. Therefore, the type of system a property owner installed would be dictated at time of contract with the “public utility.” This practice would, in effect, restrict the marketplace to a few products and would support an inflated cost of those products.
2. GWP could not hold the “public utility” responsible for lack of maintenance due to the statutory requirement that the property owner be the responsible party for insuring maintenance.
3. Ownership of the ATSDS system by an entity other than the property owner removes the option that the homeowner would currently have to effectuate a change to the system (by State permit). For example, if a property owner elected to add a bedroom to the residence a modification would be required of the ATSDS. If the ATSDS were owned by a “public utility” permission would have to be granted from the utility in order to modify the system. If the property owner elected to implement other suitable (per State standard) technology, the utility would be the deciding entity.
4. Generally speaking, “public utility” ownership of the ATSDS system with the system on private property is problematic. Can the property owner drive over the system? How large can a lawn mower be and not impact the drip lines? What should the moisture content of the soil be before the area can be crossed? What type of tree can I plant in my yard? How close can it be to the drip field?

5. Costs for ATSDDD system components, installation, operation and maintenance would not be a reflection of free-market competition.

A number of analogous scenarios can be illustrated in support of GWP's proposed model.

1. If a property owner elects to use water from a well or a spring located on the property, can he be forced to pay for water available from a public utility? Or, would the public utility also own the well or spring since it is being used as a water supply? If he elected to treat his water would that automatically result in a public authority having to enter the picture?
2. If a property owner elected to heat his home with bottled propane, would a natural gas utility enter the picture?
3. If a property owner elected to live a minimalist lifestyle but yet have a generator on site in case of emergency, would the local electrical utility own the generator?
4. If a property owner elected to use cellular phone service instead of a ground line, would the telephone utility own and dictate the type of cellular phone and the service that was provided to it?

There is one significant difference between the analogies listed above and the issue of this policy paper – failure to maintain a contract with a maintenance provider may ultimately result in a failing system and a health hazard not only to the property owner and family but to neighboring properties as well. GWP realizes the significance of this difference and this knowledge is reflected in the proposed rule change. Knowledge of a property owner's failure to maintain a contract with a maintenance provider will be realized long before lack of maintenance will result in discharge of sewage to the surface of the ground. Instances of noncompliance associated with failure to maintain a service contract will immediately result in the issuance of a Notice of Violation.

The GWP proposal will take the Division's program forward with respect to maintaining subsurface sewage disposal systems. ATS technology is not the first appearance of treatment technology in GWP regulations. Since 1997, property owners have had the regulatory option of incorporating treatment in to their permitted systems. However, this proposed regulation change is the first appearance of mandatory maintenance associated with subsurface sewage disposal systems permitted through GWP.

GWP is confident that meaningful mandatory maintenance for ATSDDD systems can be accomplished through the proposed rule change. Maintenance of these type systems is critical for the systems and for the success of this portion of GWP's program. The maintenance provider program, as proposed by GWP, is considered to be the most comprehensive of its

type. Its success will rely on cooperation between manufacturers, maintenance providers, regulatory staff and the property owners. Success does not depend on taking the property owners out of the equation. Wastewater authorities, utility districts, privately-owned public utilities, and individual service providers can all become qualified to provide maintenance to ATSDS systems. Property owners will have the option as to what ATS technology is implemented on their property and who, among all those qualified, conducts the mandatory maintenance.

References

- (1) Tennessee Code/Title 68 Health, Safety and Environmental Protection/Chapter 221 Water and Sewerage/Part 4 Subsurface Sewage Disposal Systems/68-221-401. General Requirements.
- (2) Tennessee Code/Title 68 Health, Safety and Environmental Protection/Chapter 221 Water and Sewerage/Part 4 Subsurface Sewage Disposal Systems/68-221-403(a). Duties of commissioner and department – Permit approval – Subsurface Sewage Disposal Requirements.
- (3) Tennessee Code/Title 68 Health, Safety and Environmental Protection/Chapter 221 Water and Sewerage/Part 4 Subsurface Sewage Disposal Systems/68-221-403(h). Duties of commissioner and department – Permit approval – Subsurface Sewage Disposal Requirements.
- (4) Rules of Department of Environment and Conservation, Division of Ground Water Protection, Chapter 1200-1-6, Regulations to Govern Subsurface Sewage Disposal Systems, January 2006.
- (5) United States Environmental Protection Agency, Onsite Wastewater Treatment Systems Manual, February 2002.
- (6) Consortium of Institutes for Decentralized Wastewater Treatment, Residential Onsite Wastewater Treatment Systems: An Operation and Maintenance Service Provider Program, 2005.
- (7) United States Environmental Protection Agency, Voluntary National Guidelines for Management of Onsite and Clustered (Decentralized) Wastewater Treatment Systems, March 2003.
- (8) Water Environment Research Foundation, Guidance for Establishing Successful RMEs: Scoping Paper (DEC5R06), 2008.

Comment Bibliography

- (a) Wesley Barger, Watts Bar Utility District, PO Box 910, Kingston, TN 37763
- (b) Brianne Lankford, TN Pump and Controls, LLC, PO Box 23695, Knoxville, TN 37933

(c) Mickey Barger, Holiday Shores Water Services, Inc. PO Box 370, Kingston, TN 37763

(d) Travis Wolfe, 1017 Hamilton Lane, Kingston, TN 37763

(e) Eric Barger, C.R. Barger & Sons, Inc., 238 Mays Valley Road, Harriman, TN 37748

The above-listed commentators faxed information from the same fax line between 12:30 PM and 12:50 PM on May 16, 2008.

(f) Michael Hines, Southeast Environmental Engineering, LLC, 1920 Breezy Ridge Trail, Concord, TN 37922

(g) Robert J. Pickney, Adenus, 849 Aviation Parkway, Smyrna, TN 37167

All individuals providing comment to the November 2007, proposed rule change will be provided a copy of the August 2008 proposed rule change for which a new comment period will be established. The November 2007 version is no longer valid.